8 p. m., latitude 15° 29′ N., longitude 111° 39′ W.: Vessel steering N. 21 W. (true). Barometer 29.72. Strong wind, with occasional violent squalls of wind and rain. Rough sea. Sky heavily overcast.

10 p. m.: Barometer 29.60. Wind increasing to strong gale, with frequent squalls of hurricane force and torrential rain.

Midnight: Barometer 29.47. Whole gale, with frequent violent squalls of hurricane force; extremely heavy rainstorm. Rough sea and moderate NE. swell.

July 10, 1 a. m.: Barometer 29.20, and falling very rapidly. Wind backing (west).

1.15 a. m.: Turned vessel around to SE. and reduced to half speed.

2 a. m.: Barometer 28.90. Heavy storm. Wind of hurricane force; torrential rain accompanied by vivid lightning. Rough sea. Moderate NE. swell.

3 a. m.: Barometer 29.15, rising rapidly. Wind backing to SW.

4 a. m.: Barometer 29.35. Weather clearing and storm abating.

4.15 a. m.: Turned vessel around to course N. 45 W. (true). Proceeded full speed.

6 a. m.: Barometer 29.66. Strong wind, occasional heavy squalls of wind and rain, overcast, rough sea and heavy swell.

The second storm occurred during the second decade of July. The American S. S. *Edgemoor* was involved in rough weather for several days. The observer's report follows:

From Cape Mala on July 11 to midnight of the 26th, over the Great Circle to Honolulu (near 21° N., 144° W.) we had continuous heavy rain squalls. Only twice during this time did we get our position from observation.

On July 17, with sky overcast, squally with light rains, the wind which had been moderate began to slowly increase in force and rain squalls becoming heavier, each day increasing until the 22d, when wind attained a force of 10. Weather had cyclonic indications. On the 22d hove vessel to, heading south for 10 hours, when about 6 p. m. breaks showed in clouds and wind diminished to fresh, blowing from SSE.

The more or less stagnant condition of the atmosphere in middle and higher latitudes resulted in the formation of an extraordinary amount of fog over the entire width of the ocean along the northern sailing routes. In some part of the long and broad area between 170° W. and 150° E. it occurred on every day of the month. The American S. S. *West Chopaka*, Japan to San Francisco, experienced fog from the 19th, in 46° 30′ N., 149° 38′ E., until the 28th, in 46° 29′ N., 146° 01′ W. Fog was also frequent along our coast, especially from San Francisco southward to the 25th parallel.

NOTE.—American S. S. *Ohioan*, New York to San Pedro, Capt. L. C. S. Smith, Observer R. M. Pierce, second officer:

July 15, 14° 39′ N., 95° 40′ W., at 1.40 p. m.: Encountered a whirlwind which removed wooden boat covers and blew water 20 or 30 feet in air. This disturbance had an anticlockwise rotary movement, and after passing about 4 miles to the westward formed two waterspouts. Barometer read 29.79. Temperature of water, 81°.

ONE DESTRUCTIVE TYPHOON IN LUZON DURING JUNE

By REV. JOSÉ CORONAS, S. J.

[Weather Bureau, Manila, P. I.]

Although the northern part of Luzon suffered from heavy rains and floods in several days of June, yet only one destructive typhoon traversed the Philippines during this month causing great damage in several Provinces, but most particularly to the Provinces of Camarines Norte, Bulacan and Nueva Ecija. The Province of Camarines Norte, however, is the one that suffered most from the hurricane winds, floods and heavy rains, the barometer at Daet having fallen at least to 722.25 mm. (28.44 ins.) at 7:35 a. m. of the 24th. As the barograph did not work satisfactorily, we do not know just the exact barometric minimum.

Very probably the typhoon was formed near the Philippines on the 21st about 120 miles east of San Bernardino Strait or 80 miles to the east of northern Samar. It moved probably WNW. or NW. by W. at the beginning, then almost due west until it reached Daet. Fortunately, however, for Manila, after causing great destruction in Camarines Norte it took again a northwesterly direction, thus passing the center 30 or 40 miles to the NE. of Manila. At 6 a. m. of the 25th the typhoon was already in the China Sea to the W. of central Luzon.

The approximate positions of the center at 6 a. m. of the 24th, 25th and 26th were as follows:

June 24, 6 a. m., 123° 15′ long. E. 14° 05′ lat. N.
June 25, 6 a. m., 119° 05′ long. E. 16° 35′ lat. N.
June 26, 6 a. m., 113° 20′ long. E. 20° 05′ lat. N.

DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

A month of much stagnation in the movement of cyclones and anticyclones. The latter were fairly numerous for a summer month and apparently were offshoots from the North Pacific HIGH that first appeared in the Canadian Northwest or off the Washington and Oregon coasts. The usual details follow.

CYCLONES AND ANTICYCLONES

By W. P. DAY

The number of highs charted during the month was considerably above the normal, and a large majority were of the so-called Alberta type. However, these high-pressure waves could generally be traced back over the North Pacific Ocean, but moving in higher latitudes they first appeared on our daily charts over the Canadian Provinces of Alberta or Saskatchewan. Their oceanic origin was further indicated by a large lapse in temperature at relatively high levels (2,500–3,500 meters), whereas a more typical high from the Canadian interior shows, at this season at least, an underrunning wedge of cool air with a strong inversion at 2,000–2,500 meters.

There were few well-defined storm areas. Precipitation occurred mostly in troughs of low pressure in connection with the increased laspe rate produced by the advancing side of the high-pressure areas previously mentioned.

FREE-AIR SUMMARY

By V. E. JAKL, Meteorologist

The averages for the aerological stations given in Table 1 show that free-air temperatures over middle and eastern portions of the country ranged from somewhat below normal over the more northerly sections to about or slightly above normal at the most southerly stations. Approximately normal lapse rates prevailed, as shown by the fact that departures at all stations varied but slightly with altitude.

The departures in temperature show a fair correspondence with wind directions for the month. Wind resultants from kite (see Table 2) and pilot balloon observations show, within the range of altitudes for which temperature averages were obtained, that southwesterly and westerly winds were prevalent over Groesbeck and Due West, respectively, while elsewhere they were in

general northwesterly, particularly in the higher altitudes. This northerly component at the stations and levels concerned was moreover more pronounced than normal for the month.

The bearing of these resultant winds and temperature departures on the precipitation is apparent from the records. Over the southern States, where the trend of winds was from the southwest and west up to over 4,000 meters, the precipitation—except along the coasts—was apparently mostly of a local convectional nature, and over considerable portions was scanty. This was particularly true of Texas, where at Groesbeck, the most severe drought in years was experienced. Also at Due West, S. C., very little precipitation occurred after the 7th. On the other hand, at Broken Arrow, Okla., 300 miles north of Groesbeck, where the winds had a northerly component above 2,000 meters, precipitation was frequent and abundant. Broken Arrow was often under the influence of the moving highs and lows that affected the more northerly portions of the country, while Due West and Groesbeck, as usual for the time of year, were largely under the influence of more or less stagnant pressure conditions.

The local nature of much of the showery weather in the South is illustrated in a number of the free-air records. At Groesbeck, where most of the precipitation of the month occurred on the 1st, the pilot balloon record of the a. m. observation of that date, shows winds ranging from 1 m. p. s. on the ground to 8 m. p. s. at 7,000 meters, and at the p. m. observation no velocity exceeding 6 m. p. s. was recorded below 6,000 meters. At Due West, from the 5th to 7th, during which period most of the precipitation occurred, winds averaging less than 4 m. p. s. prevailed up to 9,000 meters. At Broken Arrow the precipitation also appears to have been of a local convectional nature on some days, as shown by the following kite record for the 13th, which was made a few hours before the occurrence of a thunderstorm accompanied by copious rainfall. It will be noted that there was light wind throughout the observed range of altitude, and a high lapse rate with gradually increasing humidity from the ground up to the level of incipient condensation (at 2,361 meters). The pressure was stationary during the observation.

Altitude, m. s. l.	Temperature	$\frac{\Delta t}{100m}$	Relative humidity	Wind direction	Wind velocity
Meters	° *C.*		*Per cent*		*M. p. s.*
233 (surface)	34.5		40	WSW.	4.5
1,612	19.7	1.07	82	W.	4.2
2,361	13.2	0.87	98	W.	6.2
3,109	7.8	0.72	82	WSW.	5.4
4,202	0.8	0.64	98	SW.	3.6

For comparison with a more northerly station the kite observation at Drexel on the 8th is also reproduced, and appears in the following table. This observation was followed in a few hours by a severe thunderstorm with over three inches of rainfall. For Drexel, which lay between a weak low on the south and a pronounced high on the northwest, the record shows a succession of strata having variable lapse rates and humidities, with no percentage of humidity approaching saturation except at the extreme upper limit, while the winds were fairly strong and the pressure fell rapidly. Broken Arrow, on the other hand, was in a region of ill-defined pressure distribution, and shows little of these conditions.

Altitude, m. s. l.	Temperature	$\frac{\Delta t}{100m}$	Relative humidity	Wind direction	Wind velocity
Meters	° *C.*		*Per cent*		*M. p. s.*
396 (surface)	34.8		51	SSE.	5.8
1,688	20.3	1.12	85	S.	10.0
2,064	20.9	0.16	29	S.	9.8
3,207	10.2	0.94	43	SSW.	10.0
4,664	−1.7	0.82	88	SSW.	7.8
5,017	−3.3	0.45	77	SSW.	8.1

While resultant winds showed the light velocities and small increase with altitude normal for the season, individual cases were observed where the increase in velocity with altitude was equal to any observed in the winter season. This was particularly so in numerous cases of so-called "nocturnal inversion" winds in the lower levels, in which light winds at the surface increased in the first few hundred meters to about 25 m. p. s., with no accompanying marked gradients in the sea level pressure.

In the midsummer months, with their prevailingly weak temperature gradients, a wind of nearly uniform direction but of no great velocity frequently extends to considerable heights. When occurring in connection with fairly well defined surface pressure distribution, these winds are often observed to prevail from the ground up, as at Ellendale on the 31st, when a two-theodolite pilot balloon observation made in front of a high showed due north wind of nearly uniform velocity up to 7,500 meters. With indifferent pressure this "solid" wind may begin at some distance aloft, as at Broken Arrow on the 24th and 25th, when two-theodolite observations showed winds veering from southerly to westerly to about 4,000 meters, and practically uniform northwesterly winds thereafter to 14,000 meters.

Easterly winds at high altitudes were occasionally observed early in the month as far north as Drexel and Washington. It was only at the most southerly stations, however, that they occurred frequently enough to show in the resultants. Key West had resultant easterly winds from the ground to the highest altitudes observed, while at Groesbeck there was a decided easterly component at 5,000 meters and above. A typical example of this frequent midsummer wind structure at Groesbeck is given in the two-theodolite observation of the 16th, which shows light winds changing from southerly to northerly with altitude to 3,500 meters, above which, moderate to strong winds from nearly due east prevailed up to 12,000 meters. On this date Groesbeck was some distance south of a strong high-pressure area.

TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressure during July, 1925*

TEMPERATURE (°C.).

Altitude m. s. l. meters	Broken Arrow, Okla. (233m.)		Drexel, Nebr. (396m.)		Due West, S. C. (217m.)		Ellendale, N. Dak. (444m.)		Groesbeck, Tex. (141m.)		Royal Center, Ind. (225m.)	
	Mean	Departure from 7-yr. mean	Mean	Departure from 10-yr. mean	Mean	Departure from 5-yr. mean	Mean	Departure from 8-yr. mean	Mean	Departure from 7-yr. mean	Mean	Departure from 8-yr. mean
Surface	26.8	−0.1	24.6	0.0	29.5	+2.2	20.3	−0.9	28.0	+1.1	24.1	−1.1
250	26.7	−0.1	------	------	29.0	+2.1	------	------	26.9	+1.0	23.7	−1.2
500	25.2	0.0	23.8	−0.2	25.8	+1.5	19.8	−1.1	24.6	+0.6	21.1	−1.3
750	24.4	+0.6	22.4	−0.3	23.8	+1.3	18.4	−1.2	23.5	+0.7	19.3	−1.2
1,000	23.2	+0.8	21.1	−0.2	22.1	+1.4	17.2	−1.2	22.9	+1.1	17.4	−1.3
1,250	21.7	+0.9	19.8	−0.1	20.2	+1.3	16.1	−1.2	22.0	+1.4	15.4	−1.6
1,500	20.1	+0.9	18.3	−0.1	18.3	+1.1	14.5	−1.6	20.7	+1.5	14.0	−1.4
2,000	16.8	+0.8	16.1	+0.7	14.5	+0.6	11.5	−1.9	17.7	+1.2	11.0	−1.6
2,500	13.5	+0.7	12.8	+0.6	10.6	−0.1	8.3	−2.1	14.8	+1.1	8.6	−1.3
3,000	10.2	+0.7	9.4	+0.5	6.8	−0.7	5.5	−2.0	11.6	+0.7	5.5	−1.4
3,500	7.2	+0.6	5.9	+0.4	3.7	−0.6	3.0	−1.6	8.5	+0.6	2.9	−1.1
4,000	4.0	+0.6	2.3	0.0	0.9	−0.6	0.2	−1.7	4.9	+0.2	−0.6	−1.8
4,500	1.4	+0.6	−1.5	−0.5	------	------	−2.0	−1.5	------	------	------	------
5,000	−1.3	+0.6	−4.3	−0.7	------	------	−4.6	−1.4	------	------	------	------

RELATIVE HUMIDITY (%)

Surface	66	−3	60	−5	54	−11	65	−4	66	−7	64	+2
250	66	−3	------	------	54	−11	------	------	69	−5	64	+2
500	64	−2	59	−4	58	−9	64	−4	73	−2	66	+2
750	61	−4	58	−2	61	−8	61	−3	70	0	70	+4
1,000	59	−6	57	−2	62	−9	57	−4	60	−5	72	+5
1,250	60	−6	56	−2	63	−9	55	−4	53	−9	74	+7
1,500	62	−4	56	−2	64	−7	55	−2	52	−9	72	+5

TABLE 1.—*Free-air temperatures, relative humidities, and vapor pressure during July, 1925*—Continued

RELATIVE HUMIDITY (%)—Continued

Altitude m. s. l. meters	Broken Arrow, Okla. (233m.)		Drexel, Nebr. (396m.)		Due West, S. C. (217m.)		Ellendale, N. Dak. (444m.)		Groesbeck, Tex. (141m.)		Royal Center, Ind. (225m.)	
	Mean	Departure from 7-yr. mean	Mean	Departure from 10-yr. mean	Mean	Departure from 5-yr. mean	Mean	Departure from 8-yr. mean	Mean	Departure from 7-yr. mean	Mean	Departure from 8-yr. mean
2,000	65	0	48	−8	69	−2	52	−2	54	−5	71	+9
2,500	67	+3	51	−4	71	0	51	−1	55	−2	55	0
3,000	71	+8	50	−4	67	−2	48	−1	59	+3	53	+1
3,500	73	+11	53	−1	58	−7	45	−3	65	+8	54	+5
4,000	77	+15	59	+7	60	−1	43	−5	75	+16	56	+11
4,500	67	+11	86	+30	------	------	34	−15	------	------	------	------
5,000	66	+8	86	+34	------	------	36	−10	------	------	------	------

VAPOR PRESSURE (*mb.*).

Surface	22.92	−1.07	18.69	−1.16	21.05	−1.69	15.62	−1.63	24.47	−0.94	19.68	−0.15
250	22.85	−0.94	------	------	20.76	−1.62	------	------	23.96	−0.54	19.29	−0.25
500	20.44	−0.42	17.57	−1.24	18.61	−1.33	14.91	−1.75	22.23	+0.07	17.07	−0.19
750	18.63	−0.10	15.58	−1.03	17.37	−1.05	13.00	−1.39	19.75	+0.40	16.12	+0.41
1,000	16.84	−0.22	14.17	−0.91	16.04	−0.99	11.08	−1.72	16.19	−0.57	14.72	+0.31
1,250	15.53	−0.06	12.90	−0.81	14.67	−1.02	9.83	−1.62	13.52	−1.29	13.44	+0.43
1,500	14.43	+0.31	11.67	−0.68	13.53	−0.51	8.91	−1.30	12.29	−1.13	11.76	+0.14
2,000	12.41	+1.04	8.77	−1.08	11.75	+0.25	6.82	−1.38	10.59	−0.59	9.35	+0.51
2,500	10.56	+1.44	7.61	−0.24	9.55	+0.23	5.47	−1.21	9.11	−0.10	6.28	−0.18
3,000	9.06	+1.78	6.48	+0.29	7.22	−0.17	4.48	−0.86	7.96	+0.21	5.43	+0.36
3,500	7.60	+1.69	5.76	+0.85	5.27	−0.24	3.70	−0.74	7.62	+1.05	5.16	+1.14
4,000	6.36	+1.83	5.38	+1.48	4.65	+0.42	2.90	−0.75	7.64	+2.00	4.38	+1.27
4,500	4.96	+1.66	5.95	+2.61	------	------	1.92	−1.32	------	------	------	------
5,000	4.69	+1.63	5.05	+2.50	------	------	1.72	−1.19	------	------	------	------

TABLE 2.—*Free-air resultant winds (m. p. s.) during July, 1925*

Altitude, m. s. l. (meters)	Broken Arrow, Okla. (233 meters)				Drexel, Nebr. (396 meters)				Due West, S. C. (217 meters)				Ellendale, N. Dak. (444 meters)				Groesbeck, Tex. (141 meters)				Royal Center, Ind. (225 meters)			
	Mean		7-year mean		Mean		10-year mean		Mean		5-year mean		Mean		8-year mean		Mean		7-year mean		Mean		8-year mean	
	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.	Dir.	Vel.
Surface	S. 16°E.	2.3	S. 2°E.	3.0	S. 50°W.	0.7	S. 3°W.	2.0	S. 71°W.	2.5	S. 67°W.	1.3	N. 14°W.	2.5	N. 19°W.	0.1	S. 33°W.	5.5	S. 21°W.	3.6	S. 84°W.	1.9	S. 80°W.	1.7
250	S. 14°E.	2.4	S. 2°E.	3.2	------	------	------	------	S. 70°W.	2.7	S. 69°W.	1.4	------	------	------	------	S. 31°W.	6.6	S. 22°W.	4.4	S. 81°W.	1.9	S. 80°W.	1.8
500	S. 10°W.	4.0	S. 11°W.	4.6	S. 31°W.	0.9	S. 4°W.	2.9	S. 76°W.	3.1	S. 78°W.	2.0	N. 19°W.	2.8	S. 7°W.	.2	S. 37°W.	8.4	S. 30°W.	6.2	N. 87°W.	4.1	S. 76°W.	3.3
750	S. 24°W.	4.7	S. 20°W.	5.0	S. 66°W.	1.8	S. 18°W.	3.9	S. 80°W.	3.3	S. 85°W.	2.4	N. 39°W.	2.6	S. 22°W.	1.1	S. 36°W.	8.6	S. 30°W.	6.3	N. 83°W.	5.2	S. 76°W.	4.2
1,000	S. 31°W.	4.4	S. 27°W.	4.8	S. 83°W.	2.4	S. 26°W.	4.3	W.	3.6	S. 88°W.	2.7	N. 44°W.	3.1	S. 50°W.	1.7	S. 32°W.	8.1	S. 30°W.	6.0	N. 79°W.	6.6	S. 80°W.	4.8
1,250	S. 42°W.	4.0	S. 32°W.	4.6	N. 88°W.	3.0	S. 38°W.	4.4	N. 89°W.	4.7	S. 86°W.	3.0	N. 69°W.	3.0	S. 60°W.	2.2	S. 30°W.	6.7	S. 31°W.	5.4	N. 86°W.	6.8	S. 81°W.	5.5
1,500	S. 55°W.	3.8	S. 37°W.	4.5	N. 80°W.	4.5	S. 47°W.	4.4	N. 85°W.	6.1	S. 87°W.	4.3	N. 54°W.	4.5	S. 72°W.	2.9	S. 26°W.	5.6	S. 31°W.	4.9	N. 84°W.	8.5	S. 86°W.	6.2
2,000	S. 79°W.	2.6	S. 41°W.	3.6	N. 81°W.	5.0	S. 58°W.	4.9	N. 78°W.	7.6	S. 88°W.	5.6	N. 49°W.	5.4	S. 87°W.	4.2	S. 23°W.	4.2	S. 30°W.	4.0	N. 80°W.	9.1	S. 88°W.	7.3
2,500	W.	3.2	S. 52°W.	3.8	N. 78°W.	6.0	S. 73°W.	5.5	N. 73°W.	9.5	N. 88°W.	6.4	N. 56°W.	7.2	N. 84°W.	6.0	S. 7°W.	4.0	S. 27°W.	3.6	N. 73°W.	11.8	N. 87°W.	9.6
3,000	W.	3.0	S. 62°W.	4.3	N. 70°W.	6.3	S. 74°W.	6.2	S. 87°W.	11.3	S. 86°W.	7.9	N. 52°W.	8.7	N. 82°W.	7.6	S. 9°W.	5.3	S. 22°W.	3.7	N. 78°W.	8.5	S. 89°W.	11.2
3,500	N. 75°W.	5.4	S. 69°W.	2.9	N. 67°W.	8.2	S. 77°W.	7.1	N. 67°W.	10.1	N. 85°W.	7.5	N. 57°W.	11.8	N. 74°W.	9.9	S. 8°W.	7.4	S. 15°W.	2.4	N. 76°W.	9.2	S. 87°W.	10.7
4,000	N. 59°W.	6.9	S. 74°W.	6.7	N. 74°W.	9.7	S. 80°W.	7.6	N. 89°W.	11.4	N. 81°W.	8.4	N. 56°W.	12.9	N. 68°W.	11.2	S. 45°W.	8.0	N. 83°W.	1.1	N. 61°W.	9.7	N. 70°W.	9.5
4,500	N. 55°W.	12.8	S. 66°W.	8.6	S. 78°W.	7.9	S. 66°W.	7.7	------	----	------	----	N. 61°W.	13.2	N. 63°W.	13.2	S. 45°W.	7.0	N. 18°E.	3.6	N. 45°W.	10.0	N. 46°W.	8.4
5,000	N. 45°W.	15.0	S. 30°W.	4.5	S. 22°W.	8.1	S. 55°W.	8.4	------	----	------	----	N. 83°W.	14.2	N. 73°W.	15.3	------	----	------	----	------	----	------	----

THE WEATHER ELEMENTS

By P. C. DAY In Charge of Division

PRESSURE AND WINDS

The distinctive feature of the atmospheric pressure during July was the persistence of anticyclonic conditions, which produced, however, in different portions of the month almost opposite effects upon the weather over large areas of the country.

During the first half of the month anticyclones had their origin mainly over the western interior and moved slowly eastward over the Central and Southern States. This distribution favored warm weather over most of the country from the Rocky Mountains eastward, with frequent thundershowers and local high winds, particularly over the Central States, from the 12th to the 16th.

Beginning with the middle of the month and continuing until the close, anticyclones entered the United States at frequent intervals from the Canadian Northwest, and, moving eastward mainly over the Northern States, favored changes to cooler weather over all northern and central districts. During this period showers still prevailed in many northern and central districts, and local high winds were rather frequent, particularly about the 24th to the 26th from the middle plains eastward to Pennsylvania and Maryland.

The cyclones were of the ordinary summer type, though fewer in number and mainly less well defined than usual. No single cyclone materially influenced precipitation over any extensive path, save in a few cases along the northern border, and on the 26th to 28th when a low pressure area moved along the coast from North Carolina, passing east of New England attended by moderate to locally heavy rains.